

IPRenewal NPEmails

From: Stuyvenberg, Andrew
Sent: Tuesday, August 11, 2009 8:32 AM
To: Gray, Dara F
Cc: Logan, Dennis; Valerie Cullinan; Ward, Jeffrey A; IPRenewal NPEmails
Subject: RE: Conference Call Details
Attachments: 8-11-09_NRC Conference Call Items.doc

Dara -

Attached is the more-detailed description of specific informational issues that I mentioned yesterday. I recognize that your team will not have much time to review it prior to the call, but it may be a useful preface. The attached document describes in greater depth the two issues from my previous e-mail (items 2 and 3, respectively, on the attached document) and also identifies an additional issue (item 1 in the attachment) that we would like to resolve, if possible, during this conference call.

In addition, during the conference call, please have copies of NL-07-156, as well as the dSEIS comments handy for the discussion (or have them available electronically).

Many thanks, and please let me know if you have any additional questions.

Best regards,
Drew

From: Stuyvenberg, Andrew
Sent: Thursday, August 06, 2009 4:07 PM
To: Gray, Dara F
Cc: IPRenewal NPEmails
Subject: Conference Call Details

Dara -

The NRC staff biologists have two specific needs in this conference call. Both issues are closely related.

- 1.) NRC staff has been unable to generate the same impingement densities that Entergy produced in Table C-7 of Entergy's comments on the dSEIS using the data Entergy submitted in NL-07-156.
- 2.) NRC staff has also been unable to generate the same entrainment densities that Entergy produced in Table C-9 of Entergy's comments on the dSEIS using the data Entergy submitted in NL-07-156.

We're looking to determine whether we've missed something, whether there are differences between the data in NL-07-156 and the data used to produce the dSEIS comments, or whether Entergy has performed additional modifications, calculations, etc. to arrive at the numbers presented in the dSEIS comments. Dennis Logan, our senior biologist on the project, has also indicated that it may be worthwhile to have ASA's programmer for the data supplied in NL-07-156 available on the call, if possible. (If that's possible, and you require an extra line for that person, please let me know at your earliest convenience.)

Please let me know if you need any additional information, and please be in touch if there's anything you'd like to clarify in advance of call.

Best,
Drew

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From: Stuyvenberg, Andrew

Created By: Andrew.Stuyvenberg@nrc.gov

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Issue 1. Entergy provided impingement data to NRC in Enclosure 3 to RAI response NL-07-156 dated 12/20/07 (ML080080313; cover letter at ML080080205). The impingement data included in NL-07-156 in file contains estimated numbers of the total seasonal impingement for many taxa. During a May 11, 2009, conference call between NRC staff and Entergy (Summary at ML0914200362), Entergy staff suggested that all of the impingement data may be incorrect and could be divided by the number of days sampled for the given year (paragraph 2 of enclosure 2 to ML0914200362, excerpted in Figure 1) in order to derive correct estimates. However, NRC staff have found that the estimates of the seasonal total number impinged included in NL-07-156 do not match the estimated seasonal total number impingement reported in the annual reports of the Hudson River Ecological Study in the Area of Indian Point (ML080080209, ML080080214, ML080080216, ML080080291, ML080080298, ML080080306), even when NRC staff divides the Entergy-reported values by the number of days sampled (see example in Table 1 and Figure 2). The NRC staff needs to know which data (annual reports, Entergy-supplied, corrected figures, or other data) are correct and what correction values, if any, have been applied to historical data to derive the correct data.

TELEPHONE CONFERENCE CALL
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3
LICENSE RENEWAL APPLICATION

TELECONFERENCE SUMMARY
MAY 11, 2009

The U.S. Nuclear Regulatory Commission (NRC) staff and representatives of Entergy Nuclear Operations, Inc. (Entergy) held a telephone conference call on May 11, 2009, to discuss shortnose sturgeon impingement data, as well as to determine whether Entergy can provide additional information that will be responsive to information needs identified by the National Marine Fisheries Service (NMFS) in its February 12, 2009, letter regarding an Endangered Species Act consultation.

NRC staff indicated that they had identified apparent discrepancies in shortnose sturgeon impingement data that Entergy had reported to the NRC. The data Entergy sent to the NRC as part of its comments on NUREG-1437, Supplement 38, were inconsistent with numbers Entergy reported earlier and were inconsistent with numbers reported by NMFS. The underlying issue is whether the sturgeon count data supplied to the NRC in the Indian Point data files represent an annual census of the total number of sturgeon impinged, or whether these data are a sample of the sturgeon impinged on fewer than 365 days of each year. Specifically, the NRC staff noted that the data Entergy had reported to the NRC from certain years appeared to be multiplied by the days of sampling in those years, when the data represented a total census and no multiplication by the number of days in the sampling period was needed. Entergy staff agreed that this appeared to be an error and that the NRC staff could correct its sturgeon impingement data by dividing the numbers that Entergy reported to the NRC in certain years by the numbers of days sampled in those years. Entergy staff said that the same correction should be applied to impingement data for other species as well and that the error did not extend to other types of data, such as entrainment.

Figure 1. First two paragraphs of Enclosure 2 of ML0914200362.

Number of Days Sampled	Winter	Spring	Summer	Fall	Total
	23	8	11	41	83
ALEWIFE	315	659	3,088	2,662	6,724
BAY ANCHOVY	394	519	21,000	30,717	52,630
AMERICAN SHAD	178	503	3,249	3,043	6,973
BLUEFISH		11,465	4,622	1,247	17,335
HOGCHOKER	567	18,377	12,838	14,217	45,999
STRIPED BASS	2,918	702	15,911	18,663	38,194

Table 1. Estimated combined (EstComb) seasonal total number of fish impinged and the number of days sampled at IP 2 during 1987 from ML080080313 (NRC staff took seasonal values directly from the EstComb field in ML080080313 and summed each season's results to produce the value in the Total column; numbers rounded to the whole number).

TABLE 4-1 ESTIMATED NUMBER OF FISH IMPINGED AT INDIAN POINT UNIT 2 DURING 1987 BY TAXON AND SEASONAL STRATUM (ADJUSTED FOR COLLECTION EFFICIENCY)

Taxon	Winter	Spring	Summer	Fall	1987 Total	Standard Error	Coefficient of Variation
Alewife	11	319	3,019	213	3,562	539	15.1
Bay anchovy	49	193	20,641	3,903	24,786	9,503	38.3
American shad	7	57	2,308	267	2,639	833	31.6
Bluefish	0	1,399	4,558	71	6,028	2,245	37.2
Bluegill	30	102	560	121	813	333	41.0
Brown bullhead	52	57	134	0	243	90	37.0
Pumpkinseed	729	46	209	133	1,117	202	18.1
Black crappie	0	0	209	9	218	135	61.9
Carp	11	0	0	0	11	10	90.9
American eel	232	1,911	1,999	99	4,241	713	16.8
Goldfish	79	0	0	0	79	27	34.2
Golden shiner	123	0	0	0	123	43	35.0
Hogchoker	366	17,495	12,771	4,186	34,818	7,106	20.4
Tessellated darter	127	159	0	3	289	101	34.9
Banded killifish	1,885	114	0	68	2,067	655	31.7
Largemouth bass	7	0	0	3	10	7	70.0
Mummichog	0	68	84	0	152	102	67.1
Atlantic menhaden	7	216	552	25	800	298	37.2
Blueback herring	7	1,103	21,210	12,939	35,259	16,190	45.9
Atlantic silverside	11	0	0	13	24	9	37.5
Rainbow smelt	1,948	4,641	611	80	7,280	2,064	28.4
Smallmouth bass	7	0	59	0	66	55	83.3
Shortnose sturgeon	4	0	0	0	4	3	75.0
Spottail shiner	2,109	80	0	9	2,198	429	19.5
Atlantic sturgeon	0	0	0	0	0	0	0.0
Striped bass	2,561	557	14,369	7,392	24,879	6,039	24.3
Fourspine stickleback	52	546	0	0	598	258	43.1
Atlantic tomcod	1,406	364,387	318,303	472	684,568	358,694	52.4
White catfish	318	341	435	386	1,480	206	13.9
White perch	257,663	111,145	45,289	18,325	432,422	59,284	13.7
Yellow perch	288	0	50	12	350	70	20.0
Rock bass	0	0	0	167	167	95	56.9
Northern pipefish	0	91	176	9	276	98	35.5
Redbreast sunfish	4	0	0	0	4	3	75.0
Creville jack	0	0	0	0	0	0	0.0
Weakfish	0	0	2,593	95	2,688	960	35.7
Lookdown	0	0	0	0	0	0	0.0
Clupeid larvae	0	0	50	0	50	47	94.0
Tautog	0	0	0	0	0	0	0.0
Four bearded rockling	0	0	0	0	0	0	0.0
Striped cuskeel	0	34	0	0	34	33	97.1
Winter flounder	56	171	251	0	478	267	55.9
Tidewater silverside	0	0	0	4	4	2	50.0
Gizzard shad	153	0	100	27	280	78	27.9

Figure 2. Table 4-1 from Hudson River Ecological Study in the Area of Indian Point 1987 Annual Report; values in the table do not match the values excerpted in Table 1.

Issue 2. Entergy’s comments on the DSEIS dated March 18, 2009 (ML091040133) included a “Review of Strength of Connection Analysis Presented in 2008 NRC DSEIS for Indian Point Nuclear Power Plant” as Appendix C. Entergy staff conducted an alternative strength of connection (SOC) analysis based on the same input datasets that NRC staff used in the DSEIS analysis (Figures 3 and 4). The alternative analysis provided, Entergy indicated, consistent measures of impingement and entrainment densities and regional river densities, while removing inappropriate data use. NRC staff has been unable to generate the same impingement densities documented in Table C-7 of Entergy’s comments on the DSEIS (Table 2 of this document) using the data Entergy submitted in NL-07-156. Unless NRC staff can resolve the apparent data discrepancies, NRC staff may need the annual total of each RIS fish impinged and the volume of water withdrawn during all weeks of sampling for both Units 2 and 3 in order to independently calculate the impingement results provided by Entergy (NL-07-156).

To ascertain the possible effects of the inconsistencies in the DSEIS SOC methods, all identified inconsistencies and inappropriate uses of data were rectified. Based on those corrections, an alternative method was constructed for the impingement SOC analysis (Table C-3) and for the entrainment SOC analysis (Table C-5). The entrainment and impingement SOC analyses were re-run using the alternative methods with the same input datasets as used in the DSEIS analyses.

Figure 3. Appendix C of Entergy’s comments on the DSEIS dated March 16, 2009 page 77 of 129

Table C-3. Alternative method (inconsistencies and inappropriate use of data rectified) for computing taxon-specific estimates of impingement and Region 4 river densities for SOC analysis.

Property of Method		Impingement Density	Region 4 River Density	Consistency Between Measures of Impingement and River Densities
Input Data	Variables	# of fish impinged at Units 2 and 3 Volume of cooling water withdrawn by Units 2 and 3	BSS standing crop (# of fish) FSS standing crop (# of fish) Region 4 river volume	
	Frequency	Per week of sampling	Per week of sampling	
Summary Statistics	Seasonal (Year-specific)	N/A	Sum of: 1) Average weekly BSS standing crop (# of fish) 2) Average weekly FSS standing crop (# of fish)	
	Annual	Ratio of: 1) Total # of fish impinged at Units 2 and 3 over all weeks of sampling, over 2) Sum of volume of cooling water withdrawn by Units 2 and 3 over all weeks of sampling	Ratio of: 1) Average of seasonal standing crop estimates for Region 4, over 2) Region 4 river volume	
	Overall statistic used for ranking species	75th percentile of annual ratios	75th percentile of annual ratios	Yes
	Units of statistic used for ranking species	# of fish per 10 ⁶ m ³	# of fish per 10 ⁶ m ³	Yes
Years of Data		1979-1990	1979-1990	Yes
Life Stages		All ages collected	All ages collected	Yes

Figure 4. From Appendix C of Entergy's comments on the DSEIS dated March 16, 2009 page 80 of 129

Table 2. Impingement Density from Entergy’s Comments Appendix C Table C-7 (page 84 of 129) and calculated from impingement data provided in NL-07-156

Species	Measure of Impingement Density from Entergy’s Comments Appendix C Table C-7 (page 84 of 129)	75th Percentile of Annual Impingement Density (from Impingement Data following formula from Figure 8)
Alewife	8.6	7.62
American Shad	24	15.11
Atlantic Menhaden	2.3	1.92
Atlantic Sturgeon	0.3	0.30
Atlantic Tomcod	250	205.80
Bay Anchovy	142.9	121.39
Blueback Herring	68.6	55.99
Bluefish	12.1	11.55
Gizzard Shad	8.3	7.20
Hogchoker	47.4	41.88
Rainbow Smelt	11.3	10.52
Shortnose Sturgeon	< 0.1	0.02
Spottail Shiner	3.8	2.92
Striped Bass	46.1	42.15
Weakfish	36.6	33.85
White Catfish	4.5	3.91
White Perch	995.6	965.09

Issue 3. In the NRC DSEIS, the staff included measurements of entrainment density as part of the SOC analysis. Entergy included, in Appendix C to their comments, an alternative measure of entrainment density (Figure 5). As a result, Table C-9 of Entergy’s comments on the DSEIS contained different density results than those developed by the NRC staff. The NRC staff has attempted to generate the same entrainment densities documented in Table C-9 of Entergy’s comments on the DSEIS, but has been unable to do so using the data provided in NL-07-156 (see Table 4). Unless NRC staff can resolve the apparent data discrepancies, NRC may need the annual total of each RIS fish entrained and volume of water withdrawn for both Units 2 and 3 in order to independently calculate entrainment density rather than relying on the values in NL-07-156. (Note: As sampling during weeks 2 through 17 occurred only during one year, the NRC staff’s calculation of entrainment density included only entrainment data from weeks 18 through 32. This is consistent with the approach suggested in Entergy’s comments.)

Table C-5. Alternative method (inconsistencies and inappropriate use of data rectified) for computing taxon-specific estimates of entrainment and Region 4 river densities for SOC analysis.

Property of Method		Entrainment Density	Region 4 River Density	Consistency Between Measures of Impingement and River Densities	
Input Data	Variables	# of organisms entrained by Units 2 and 3 Volume of cooling water withdrawn by Units 2 and 3	LRS standing crop (# of fish) Region 4 river volume		
	Frequency	Per week of sampling	Per week of sampling		
Summary Statistics	Seasonal (Year specific)	Sum of weekly estimates of number of organisms entrained by Units 2 and 3 Sum of weekly cooling water withdrawal volumes for Units 2 and 3	Average of weekly standing crop estimates		
	Annual	Ratio of: 1) Annual total # of organisms entrained by Units 2 and 3, over 2) Annual total volume of cooling water withdrawn by Units 2 and 3	Ratio of: 1) Average of seasonal standing crop estimates for Region 4, over 2) Region 4 river volume		
	Overall statistic used for ranking species	75th percentile of annual ratios	75th percentile of annual ratios		Yes
	Units of statistic used for ranking species	# of organisms per 10 ⁶ m3	# of organisms per 10 ⁶ m3		Yes
Years of Data		1981, and 1983-1987	1981, and 1983-1987	Yes	
Life Stages		Eggs, Larvae and Juveniles	Eggs, Larvae and Juveniles	Yes	
Taxonomic Substitutions		Alewife, Blueback Herring, and unidentified Alosids treated collectively as River Herring Unidentified Morone spp allocated to Striped Bass and White Perch	Alewife, Blueback Herring, and unidentified Alosids treated collectively as River Herring Unidentified Morone spp allocated to Striped Bass and White Perch	Yes	

Figure 5. Table C-5 from Appendix C of Entergy's comments on the DSEIS dated March 16, 2009 page 82 of 129

Table 3. Entrainment Density values from Entergy’s Comments Appendix C Table C-9 (page 86 of 129) and values calculated by NRC staff from impingement data provided in NL-07-156

Species	Measure of Entrainment Density from Entergy’s Comments Appendix C Table C-9 (page 86 of 129)	75th Percentile of Annual Entrainment Density (from Entrainment Data following formula from Figure 9)
Alewife	503500	410077.7
American Shad	4037	600.3
Atlantic Menhaden	177	133.6
Atlantic Sturgeon	NA	NA
Atlantic Tomcod	9904	7871.4
Bay Anchovy	730827	751264.6
Blueback Herring	503500	410077.7
Bluefish	14	4.9
Gizzard Shad	NA	NA
Hogchoker	2449	3133.2
Rainbow Smelt	10773	1801.5
Shortnose Sturgeon	NA	NA
Spottail Shiner	8	5.0
Striped Bass	66607	141334.1
Weakfish	8647	5999.2
White Catfish	14	4.4
White Perch	61793	118587.7